The background of the slide features a close-up, slightly blurred image of a hand holding a pen, drawing a line graph on a grid. The graph shows a fluctuating line that generally trends upwards. The overall color palette is light blue and white, with the grid lines being thin and light blue.

# **Trends and Future Skills: Analyzing Educational Attainment, Gender Disparities, and Emerging Technologies**

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06-04-2024

# EXECUTIVE SUMMARY

- **Programming Languages:**
  - **Current Trends:** HTML is the most learned programming language, reflecting its foundational role in web development.
  - **Future Aspirations:** JavaScript is the most desired programming language to learn in the next year, indicating its critical importance in developing dynamic and interactive web applications.
- **Databases:**
  - **Current Trends:** MySQL is the most commonly learned database, showcasing its widespread use and reliability in managing relational data.
  - **Future Aspirations:** Redis is the most desired database to learn, signifying a shift towards high-performance, in-memory data storage solutions for real-time applications.
- **Gender Distribution:**
  - There is a notable gender imbalance, with men exceeding women by 4,929 respondents. This disparity highlights the need for continued efforts towards gender diversity and inclusion in the tech industry.
- **Educational Attainment:**

# METHODOLOGY

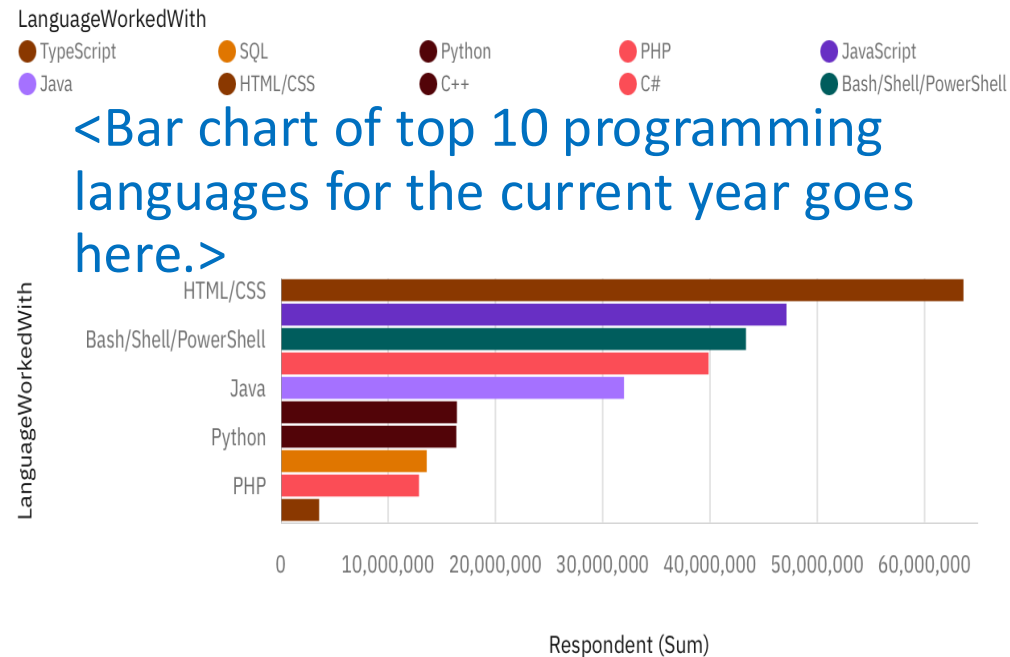
This study employed a combination of IBM Cognos, Python, and various data visualization techniques to analyze trends in educational attainment, gender distribution, and technology skill preferences among respondents. The following steps outline the methodology used to gather, process, and analyze the data:

- **Data Collection:**
  - + Data was sourced from a comprehensive survey of respondents within the technology sector, capturing information on educational attainment, gender, and preferences for programming languages and databases.
- **Data Extraction and Transformation:**
  - + IBM Cognos was utilized to extract and transform raw survey data into a structured format suitable for analysis. This involved:
    - Importing raw data from survey results into IBM Cognos.
    - Cleaning and preprocessing the data to ensure accuracy and consistency.
    - Organizing data into relevant categories such as educational level, gender, current skills, and future learning aspirations.
- **Data Analysis:**
  - + Python was employed to perform detailed data analysis, leveraging its powerful libraries such as pandas for data manipulation, NumPy for numerical operations, and matplotlib and seaborn for data visualization.
    - **Descriptive Statistics:** Calculated key statistics to understand the distribution of educational levels and gender among respondents.
    - **Trend Analysis:** Analyzed the current trends in programming languages and databases, identifying the most commonly learned technologies.
    - **Future Aspirations:** Assessed respondents' desired skills to learn in the upcoming year, highlighting emerging technologies.
- **Data Visualization:**
  - + Graphs and charts were created using Python's matplotlib and seaborn libraries to visually represent the findings, making complex data more accessible and understandable.
    - **Bar Graphs:** Illustrated the frequency of educational levels, current skill sets, and future learning aspirations.
    - **Pie Charts:** Showcased the gender distribution among respondents.
    - **Trend Lines:** Depicted the progression of interest in various technologies over time.
- **Synthesis and Reporting:**
  - + The analyzed data and visualizations were synthesized into coherent findings and implications.
  - + Key insights were summarized to highlight important trends and potential actions for stakeholders.
  - + An executive summary was prepared to provide a high-level overview of the study's findings and their implications.

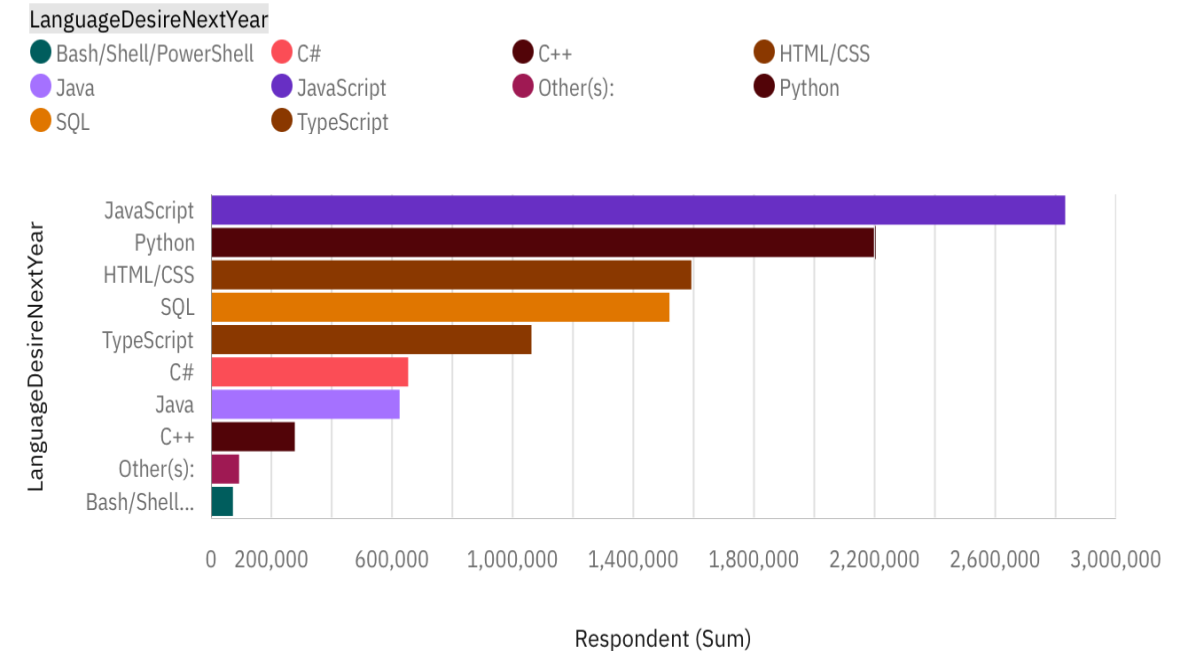
By integrating IBM Cognos for data extraction and transformation with Python for in-depth analysis and visualization, this methodology ensures a robust and comprehensive approach to understanding the dynamics of educational attainment, gender distribution, and technology skill preferences in the tech sector. This combination of tools and techniques enables accurate data processing, insightful analysis, and effective communication of results.

# Programming Language Trends Current/ Next Year

## Top 10 Languages Worked With



## Top 10 Language Desire Next Year



# PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

## Findings

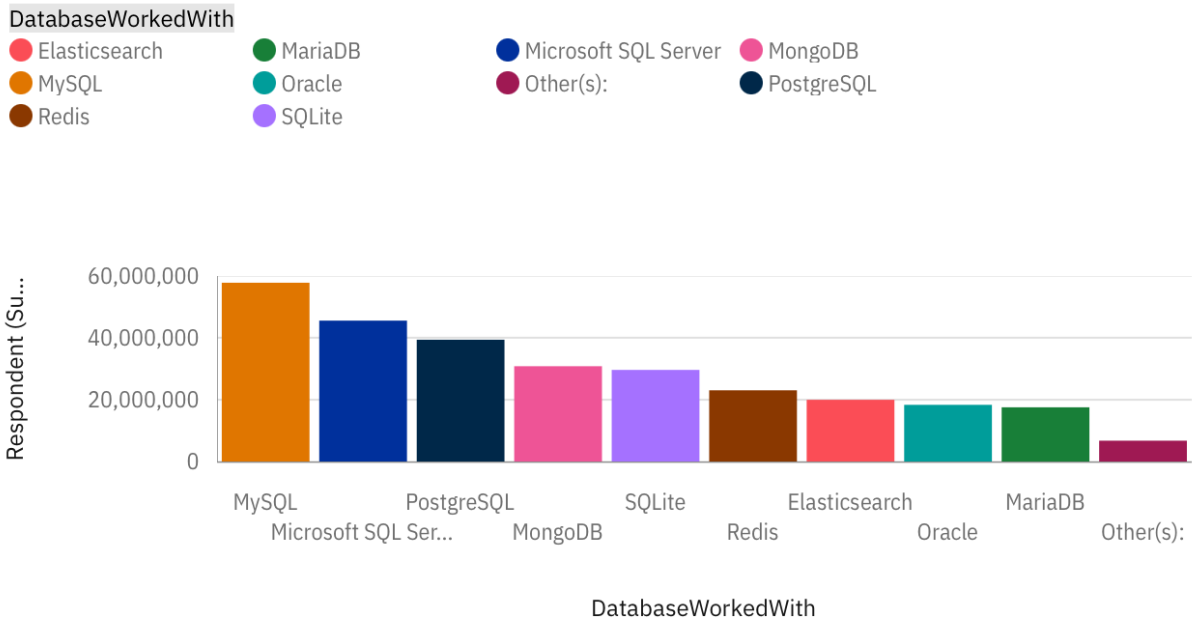
- HTML is the top programming language worked with currently.
- Javascript is the most desired language among respondents

## Implications

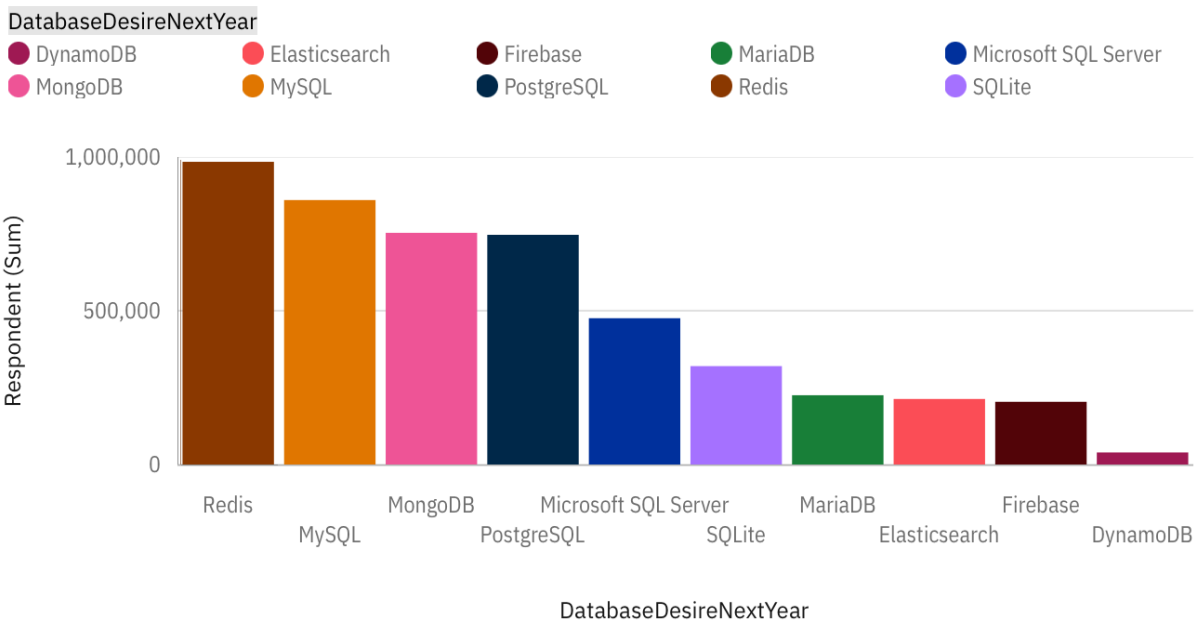
- Implication 1: HTML's popularity as the most learned language underscores its foundational role in web development.
- Implication 2 : The high interest in learning JavaScript indicates that it will remain a critical skill in the tech job market.

# Database Trends Current/Next Year

Top 10 Databases Work With



Top 10 Database Desire Next Year



# DATABASE TRENDS - FINDINGS & IMPLICATIONS

## Findings

- MySQL is the top database system used among respondents.
- Redis tends to be the most desired database that respondents want to learn.

## Implications

- MySQL's current popularity indicates its widespread use and acceptance as a reliable and robust relational database management system (RDBMS).
- The interest in learning Redis suggests a shift towards in-memory databases and the need for high-performance data storage solutions.

# DASHBOARD



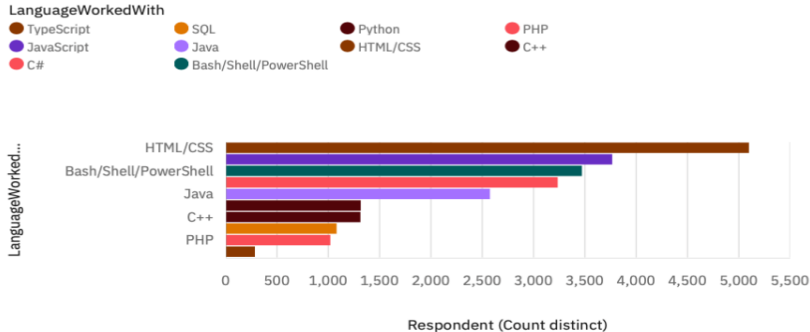
<https://github.com/Marland-Hamilton/super-robot/blob/main/capstone%20project.pdf>



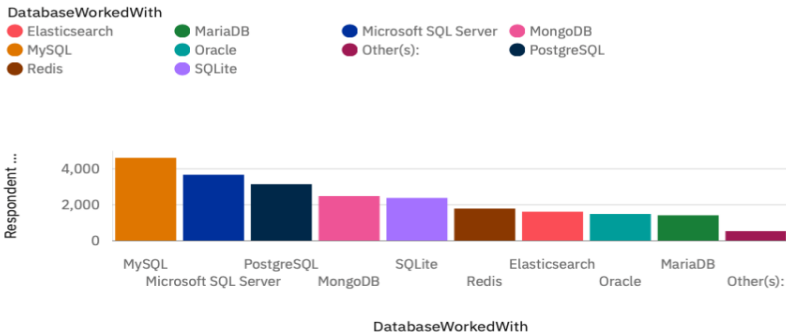
# DASHBOARD TAB 1

Tab 1

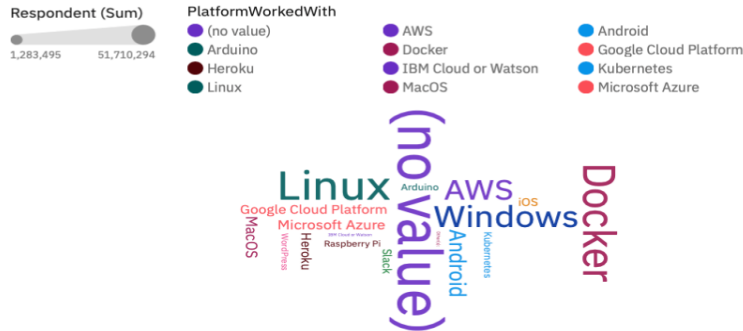
Top 10 Languages Worked With



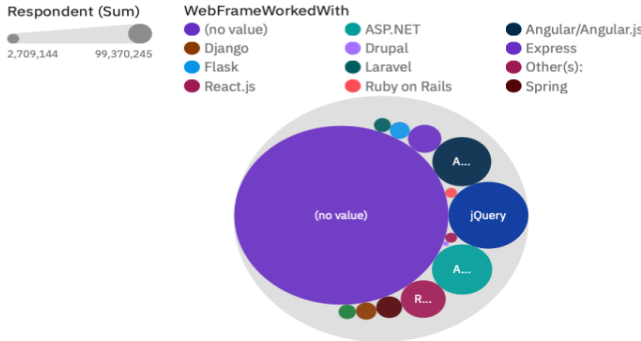
Top 10 Databases Work With



Platforms Worked With



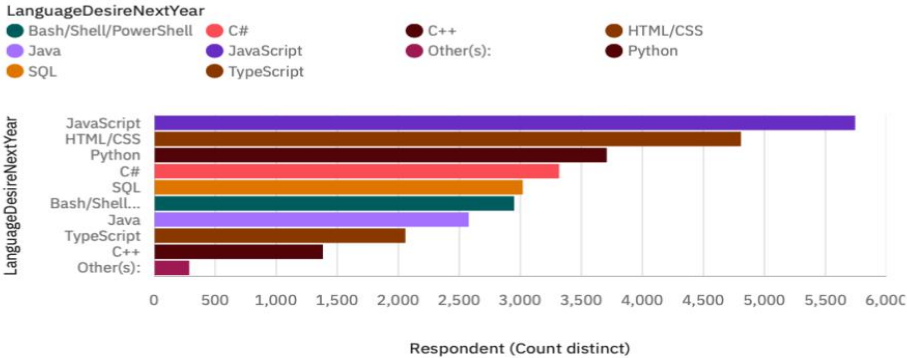
WebFrame Worked With



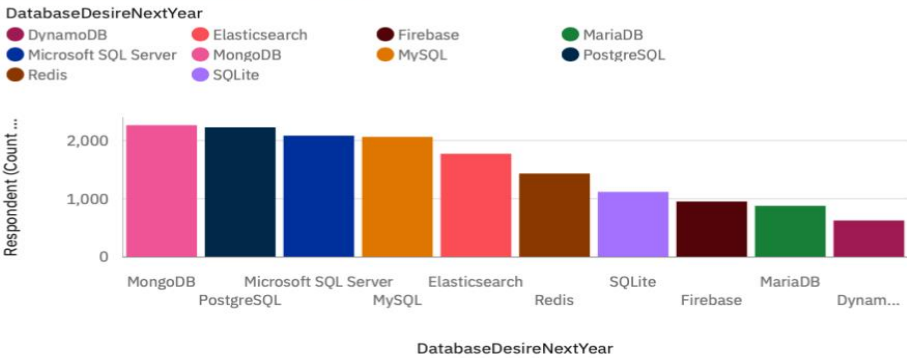
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Tab 2

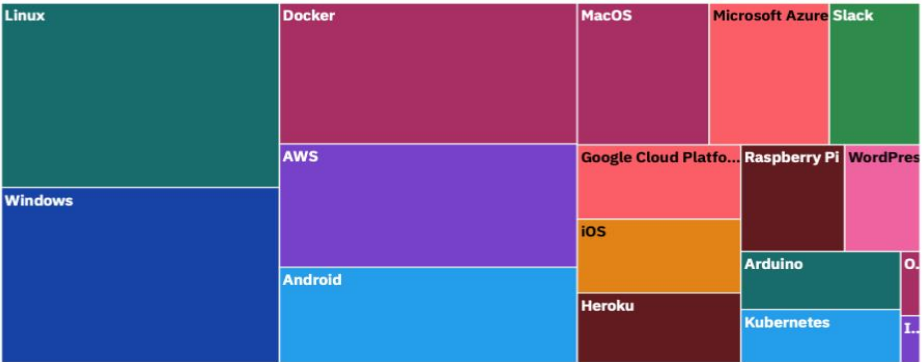
Top 10 Language Desire Next Year



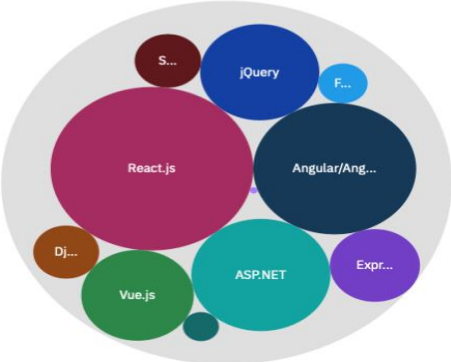
Top 10 Database Desire Next Year



Platform Worked With Next Year



Top 10 Web Frame Desired Next Year



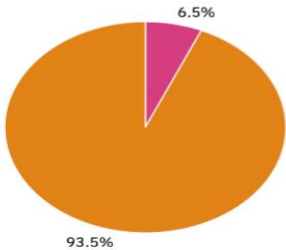
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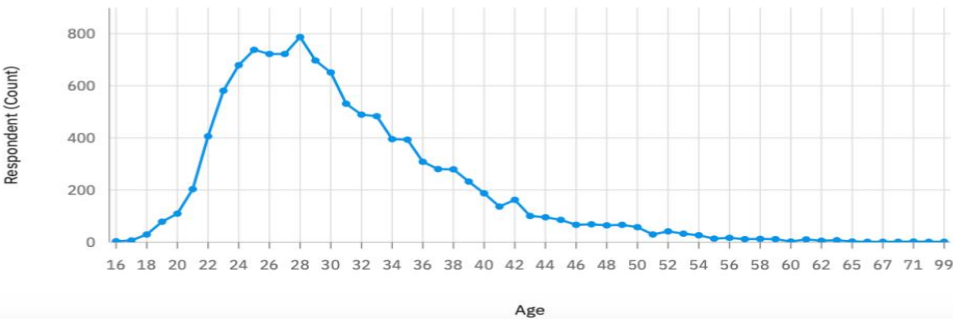
Tab 3

Respondent by Gender

Gender  
Woman Man

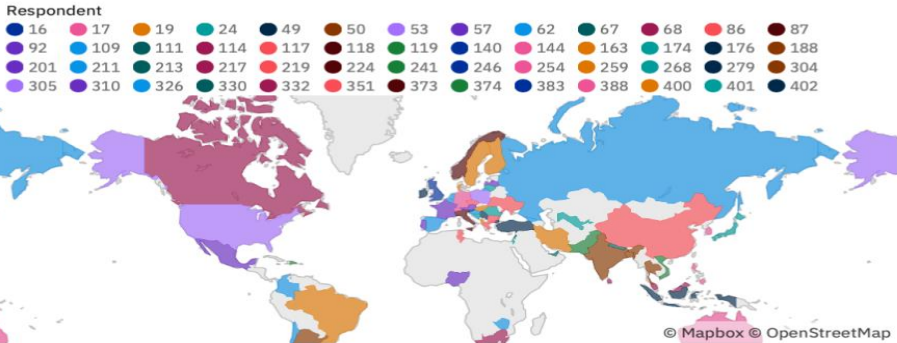


Respondent by Age

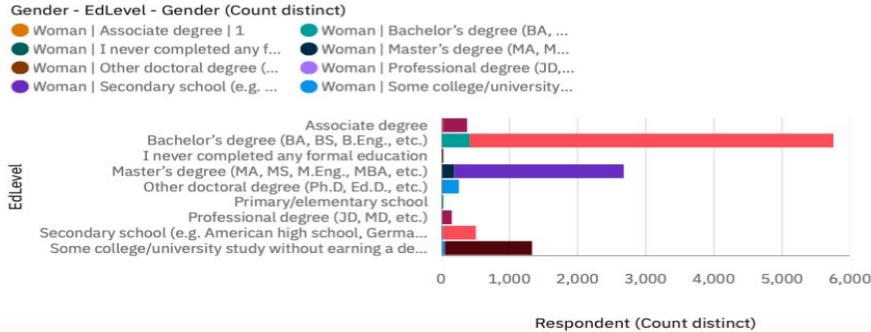


capstone project

Respondent for Country regions



Respondent by EdLevel colored by Gender, EdLevel and Gender



# OVERALL FINDINGS & IMPLICATIONS

## Findings

- Men exceed make up more than 90% of respondents compared to women with a little over 6%
- Bachelor's degree (BA, BS, B.Eng., etc.) is the most frequently occurring category of EdLevel with a count of 5,753 items with Respondent values (51.8 % of the total).

## Implications

- There is a notable gender disparity in the sample, suggesting a potential underrepresentation of women in the field or industry being surveyed.
- A significant portion of respondents hold a Bachelor's degree, indicating that this level of education is a common entry point into the industry.

# CONCLUSION

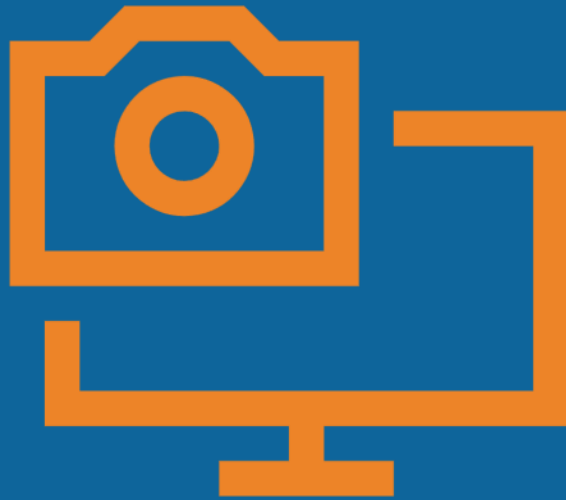


- **Educational Attainment:** A Bachelor's degree is the most common educational level among respondents (51.8%), emphasizing its importance as an entry point into the tech industry. Educational programs should align with industry needs, and employers should tailor recruitment strategies accordingly.
- **Gender Distribution:** There is a significant gender imbalance, with men exceeding women by 4,929 respondents. This highlights the need for ongoing efforts to promote gender diversity and inclusion in the tech sector.
- **Programming Languages:** HTML is the most learned language currently, while JavaScript is the most desired language to learn in the next year. This underscores the importance of JavaScript in modern web development and the need for educational programs to focus on it.
- **Databases:** MySQL is the most commonly learned database, but Redis is the most desired database to learn. This shift indicates a growing need for high-performance, real-time data storage solutions, and training programs should adapt to include modern databases like Redis.

# Innovation ideas

- **Personalized Learning Paths:** Develop an AI-driven platform that recommends tailored learning paths based on current trends like JavaScript and Redis, helping individuals upskill effectively.
- **Diversity Mentorship Programs:** Launch mentorship initiatives focused on supporting women in tech, providing guidance and networking opportunities to bridge the gender gap identified in the data.
- **Hybrid Skill Development Modules:** Create hybrid learning modules combining online courses with practical projects in high-demand areas such as JavaScript and Redis, offering real-world experience.
- **Real-Time Skills Marketplace:** Establish a platform where companies can post short-term projects requiring specific tech skills, enabling freelancers and job seekers to showcase their abilities and gain practical experience.

# APPENDIX



- Additional data source: <https://stackoverflow.blog/2019/04/09/the-2019-stack-overflow-developer-survey-results-are-in/> under a **ODbL: Open Database License**.
- [m5\\_survey\\_data\\_demographics.csv](#)
- [m5\\_survey\\_data\\_technologies\\_normalised.csv](#).